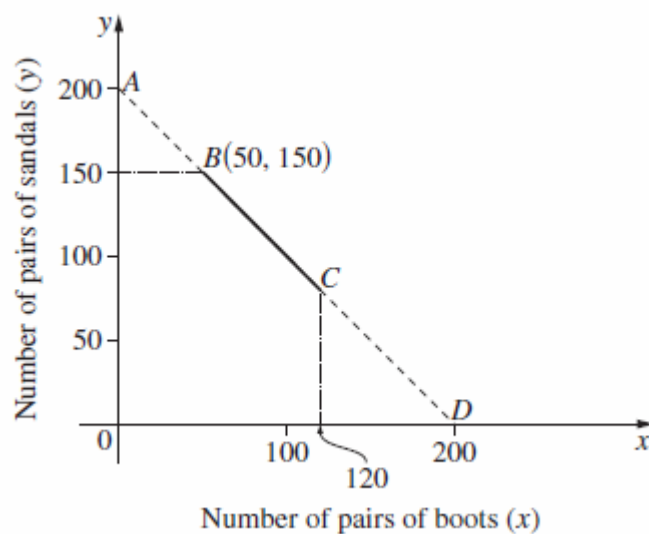


# Linear Relationships hsc past questions...

2009

- (d) A factory makes boots and sandals. In any week
- the total number of pairs of boots and sandals that are made is 200
  - the maximum number of pairs of boots made is 120
  - the maximum number of pairs of sandals made is 150.

The factory manager has drawn a graph to show the numbers of pairs of boots ( $x$ ) and sandals ( $y$ ) that can be made.



- |   |   |
|---|---|
| (i) Find the equation of the line $AD$ .  | 1 |
| (ii) Explain why this line is only relevant between $B$ and $C$ for this factory. | 1 |
| (iii) The profit per week, $\$P$ , can be found by using the equation             | 2 |

$$P = 24x + 15y.$$

Compare the profits at  $B$  and  $C$ .

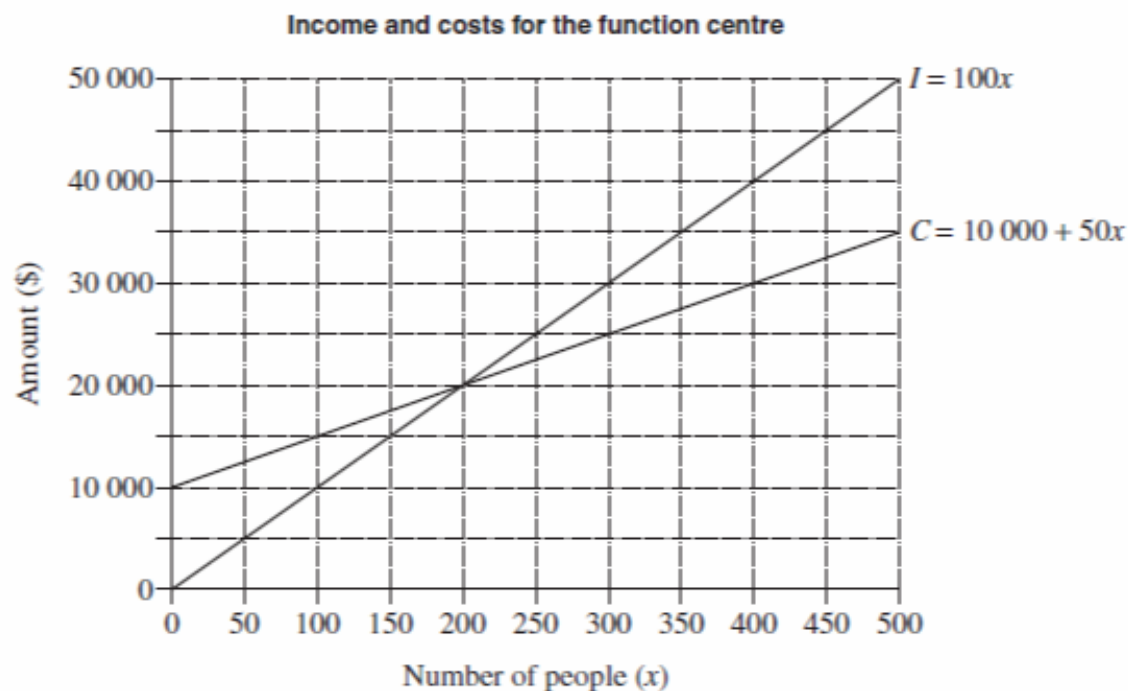
2011

- 20 A function centre hosts events for up to 500 people. The cost  $C$ , in dollars, for the centre to host an event, where  $x$  people attend, is given by:

$$C = 10\,000 + 50x$$

The centre charges \$100 per person. Its income  $I$ , in dollars, is given by:

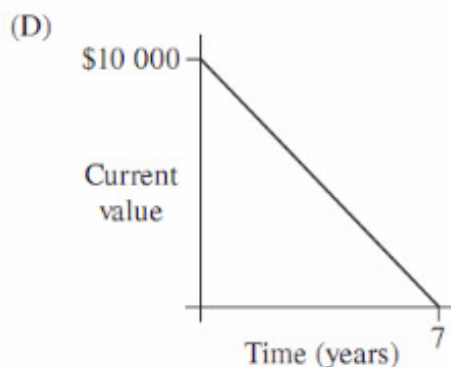
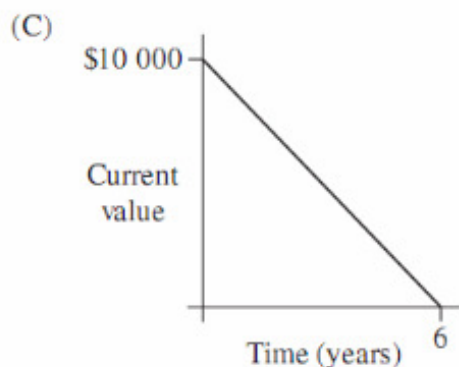
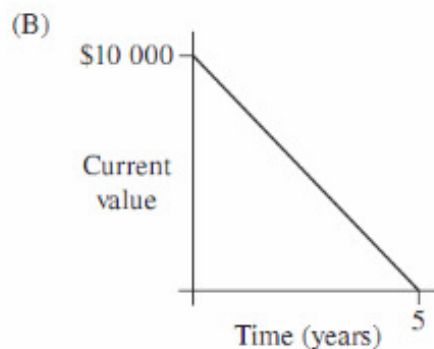
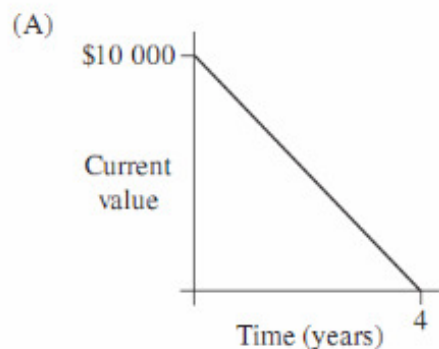
$$I = 100x$$



How much greater is the income of the function centre when 500 people attend an event, than its income at the breakeven point?

- (A) \$15 000
- (B) \$20 000
- (C) \$30 000
- (D) \$40 000

- 11 Which of the following graphs shows the lowest rate of depreciation over the given time period?



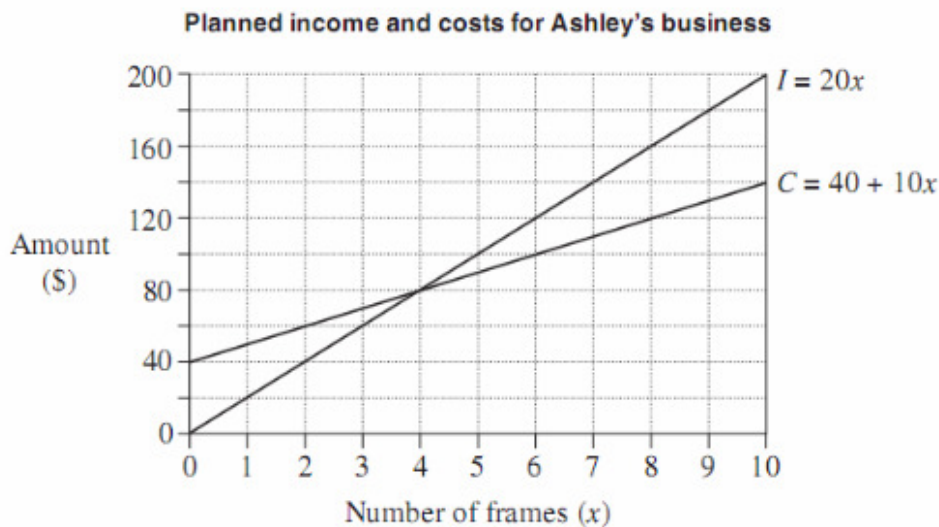
- (b) Ashley makes picture frames as part of her business. To calculate the cost,  $C$ , in dollars, of making  $x$  frames, she uses the equation

2

$$C = 40 + 10x.$$

She sells the frames for \$20 each and determines her income,  $I$ , in dollars, using the equation

$$I = 20x.$$



Use the graph to solve the two equations simultaneously for  $x$  and explain the significance of this solution for Ashley's business.

